



**Dear Montgomery County Council,**

Today, we are writing to advise you of the scientific grounds for taking action to mitigate student, teacher and staff exposures to Wi-Fi and other non-ionizing electromagnetic fields in student classrooms and dorms.

Wireless radio frequency (RF) electromagnetic (EMF) radiation and magnetic field/ extremely low frequency electromagnetic fields (ELF-EMF) are a relatively new and rapidly increasing environmental exposure in classrooms today. A substantial body of research has found these types of non-ionizing EMFs associated with numerous adverse effects including cancer, DNA damage, memory damage, headaches, reproductive damage, tumor promotion, blood brain barrier damage, increased oxidative stress, impacts to the endocrine system, brain damage.<sup>1</sup> Many of these effects could be irreversible with grave consequences for the health of staff and students.

By taking simple steps to eliminate unnecessary emission sources on school property, you can substantially mitigate the risk and lower overall exposure levels. A few specific examples of in-school sources of non-ionizing electromagnetic fields are Wi-Fi networks, laptops, electronics, electrical systems, cordless phones, cell phones and cell boosters. A cell tower or cell antennas on or near campus will also elevate ambient levels in the community.

In addition, we caution against 5G devices. 5G is the latest technology and is already being field tested in schools. The wireless industry has long pushed Wi-Fi in schools nationwide and is now proposing expanding 5G into classrooms,<sup>2</sup> arguing<sup>3</sup> that “augmented reality” and “virtual reality” are “essential tools” in classrooms.<sup>4</sup>

The peer-reviewed published research clearly shows that compliance with Federal Communications Commission (FCC) regulations regarding human exposure to radiofrequency does not ensure the safety of students and staff. More protective regulations to mitigate, monitor, investigate, and educate are moving forward in the U.S. and internationally.<sup>5</sup> In addition, PTAs and teacher unions are now responding to the strong recommendations by medical organizations, such as the American Academy of Pediatrics, by educating and supporting policy and resolutions on minimizing cell tower, cell phone and wireless radiation in classrooms.

### **Wireless Radiofrequency and Powerline ELF Non ionizing Electromagnetic Radiation are Classified as Class 2 B Possible Carcinogen by the World Health Organization**

Both magnetic field (2002) and radiofrequency radiation (2011) were classified<sup>6,7</sup> as a Group 2B possible carcinogen by the World Health Organization International Agency for Research on Cancer (IARC). However, since these determinations years ago, the published peer-reviewed scientific evidence has significantly increased-- clearly showing these types of non-ionizing electromagnetic radiation have adverse effects at emission levels governments currently allow.<sup>8,9,10,11</sup>

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Current published research has documented that the evidence is robust to now determine that RF is a proven human carcinogen.<sup>12,13,14</sup>

Numerous published scientific reports recommend that the public, especially children and pregnant women, reduce their exposure to non-ionizing electromagnetic radiation in order to protect their health- including the frequencies that range from extremely low frequency fields, to all wireless and the higher frequencies of 5G.<sup>15,16,17,18,19,20,21,22,23</sup>

### **Children and Pregnant Staff At Risk**

Research shows that this type of radiation penetrates deeper and more intensely into children due to their thinner skulls and unique physiology. Furthermore, wireless radiation has been shown to damage brain development and is associated with attention, memory and behavioral problems<sup>24</sup>. The American Academy of Pediatrics has repeatedly written to the FCC on the need for an update to the FCC's 1996 wireless exposure regulations because children are more vulnerable to the exposure.<sup>25</sup>

Human brains are still developing into the 20's and thus college students are also very much at risk. Further, students are heavy users and often sleep with their phones and wireless devices directly on their bodies. They are continuously exposed yet unaware of the risks.

Electromagnetic radiation exposure presents occupational health issues for teachers and staff, especially critical for those who are pregnant or have medical conditions. Yale research<sup>26</sup> found thyroid cancer to be associated with cell phone use in people with genetic susceptibility. Prenatal radiofrequency radiation exposure led to higher hyperactivity, poorer memory, and altered brain function in mice,<sup>27</sup> corroborating prior published research findings of altered brain development after exposure.

Kaiser Permanente researchers have published several studies where pregnant women's exposure to non-ionizing electromagnetic fields was associated with increased miscarriage as well as increased ADHD, obesity, and asthma in prenatally exposed children.

Due to the scientific evidence showing adverse effects from wireless and electromagnetic radiation at legally allowed levels,<sup>28,29,30,31,32</sup> we have joined with hundreds of doctors and scientists<sup>33</sup> calling to halt 5G<sup>34</sup> and to reduce children's overall wireless and non-ionizing electromagnetic radiation exposure. We recommend practical and actionable measures to eliminate and reduce exposures in the school setting.

Safe alternative solutions exist to connect students to the Internet, bridge the digital divide, and ensure equal access. Corded connections in classrooms rather than wireless networks are safer, faster, more secure, and do not pose the serious liability risks posed by EMFs and RF radiation.

Importantly, 5G and cell antennas should not be installed on or near schools.

### **International Policy Action**

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Many countries and schools are taking action. More than 20 countries clearly recommend that children reduce cell phone radiation. Cyprus, Belgium, France, and Israel are among the countries banning and restricting Wi-Fi in classrooms and many private schools world-wide<sup>35</sup> have started reducing EMF exposures. New Hampshire<sup>37</sup> launched an investigation into the health effects of electromagnetic radiation and released their final report with 15 recommendations including the recommendation that schools reduce radiofrequency radiation and replace Wi-Fi with wired networks in classrooms.

In regards to ELF-EMFs, over a dozen countries already have some level of protective policy in place with a magnetic field radiation limit for “sensitive areas” that ensures ELF-EMF levels do not exceed levels associated with cancer in research studies. Aside from the California Department of Education regulation that requires distances between new schools and the edge of a transmission line “right-of-way”, there exists little protections in the USA for schools as there is no federal limit for human exposure to magnetic field electromagnetic fields.

**We recommend Best Practices to Reduce EMF for schools and colleges including:**

1. Install a safe wired ethernet communication and information technology infrastructure in classrooms and education buildings to meet educational needs: Numerous solutions exist to eliminate Wi-Fi/5G/4G sources and to reduce exposures to wireless emissions in classrooms.
2. Install corded telephones in all classrooms, dorms and buildings.
3. Measure radiofrequency, magnetic field and extremely low-frequency electromagnetic fields and reduce levels to as low as possible.
4. Ensure school property is not located close to 5G/cell towers, cell network antennas, or electricity substations of high-voltage power lines.
5. Dormitories should have wired ethernet ports, not Wi-Fi connections and corded telephones for students in every room. Students should be educated on how to connect their devices as part of their orientation. Note: cell phones can be ethernet connected as well and this can substantially reduce exposure.
6. Purchasing departments can request software and hardware that will eliminate and/or reduce exposures. For example, office computers should all be ethernet connected with a wired mouse, keyboard etc. Switches should be installed to turn off Wi-Fi access points. Programs should be able to work offline and sync up when connected.
7. Launch an awareness campaign about cell phone and other wireless radiation through a new educational curriculum on how to reduce EMF: Students, teachers, and their families should be given clear information on why and how to reduce exposures to cell phone, wireless and magnetic field EMF's to protect their health.

Please see our recommendations to the U.S. Department of Education below. We ask that your institution write a letter to federal agencies supporting these requests.

1. **Call on the Environmental Protection Agency to develop science-based safety limits for human exposures to RFR and magnetic field non ionizing EMF.** The allowable human exposure limits for RFR were adopted in 1996 and have not been properly reviewed or updated since. The EPA should

develop safety limits based on a systematic review of the full body of scientific research including cancer and impacts to the brain and reproduction. The United States must also develop exposure limits on magnetic field EMF and other frequencies in the non-ionizing range used in electricity distribution, wireless power transfer and other applications. Currently there are no safety limits for school EMF exposures.

2. **Develop a national educational technology policy on Best Practices for Digital Devices in Schools that addresses the social, emotional and physical effects of screens.** In addition to students learning how to minimize the health effects of screens, school practice and curriculum should adhere to best practices developed for various age groups that minimizes health effects to students, teachers and staff.
3. **Call on the Department of Occupational Safety and Health to urgently address EMF as an environmental occupational exposure.** An evaluation of current and projected occupational exposures in educational settings is needed. Practical measures to reduce exposure are critical to supporting the health of teachers and staff.
4. **National Recommendations for No/Low EMF purchases.** Develop a list of school technology hardware and software changes that will eliminate or reduce EMF exposures in classrooms. For example, tablets and laptops should have a convenient ON/OFF hard switch for Wi-Fi and an ethernet port so using ethernet is convenient. Overhead projectors and printers and other educational technology should have Wi-Fi to OFF as the default setting.

### **The Risk of Inaction is High**

Wi-Fi, cell phones, and 5G in the classroom as well as cell towers on school property present serious liability issues.

- Insurers rank 5G and electromagnetic radiation as a “high” risk, comparing the issue to lead and asbestos.<sup>38,39</sup> A 2019 Report by Swiss Re Institute, a world leading provider of insurance,<sup>42</sup> classifies 5G mobile networks as a “high”, “off-the-leash” risk stating, “Existing concerns regarding potential negative health effects from electromagnetic fields (EMF) are only likely to increase. An uptick in liability claims could be a potential long-term consequence” and “[a]s the biological effects of EMF in general and 5G in particular are still being debated, potential claims for health impairments may come with a long latency.”
- Due to their understanding of the magnitude of this future financial risk most insurance plans have “electromagnetic field exclusions” applied as the market standard.<sup>40</sup> Portland Oregon Public School Insurance<sup>41</sup> (Pg 30) states as an example, “Exclusions: This insurance does not apply to: Bodily injury, personal injury, advertising injury, or property damage arising directly or indirectly out of, resulting from, caused or contributed to by electromagnetic radiation, provided that such loss, cost or expense results from or is contributed to by the hazardous properties of electromagnetic radiation.”
- US Mobile operators have been unable to get insurance to cover liabilities related to damages from long term exposure to radiofrequency emissions for over a decade.
- Wireless and non ionizing electromagnetic radiation are defined as a type of “pollution” by wireless companies themselves. According to pg. 10 of the Verizon Total Mobile Protection Plan, “Pollution” is defined as “The discharge, dispersal, seepage, migration or escape of pollutants. Pollutants means any solid, liquid, gaseous, or thermal irritant or contaminant including smoke, vapor, soot, fumes,



acid, alkalis, chemicals, artificially produced electric fields, magnetic field, electromagnetic field, sound waves, microwaves, and all artificially produced ionizing or nonionizing radiation and/or waste.” We found similar definitions for pollution in the product protection plans for [AT&T](#), [Sprint](#), [Verizon](#), [T-Mobile](#) and [Asuria](#).

- Wireless companies warn their shareholders of this potential future risk related to radiofrequency radiation exposure but they do not warn the users of these products, nor do they warn the people exposed to emissions from their products and infrastructure. These corporate investor warnings by companies such as [AT&T](#), [Verizon](#), [Vodafone](#) and [Crown Castle](#) are contained in their Annual Reports filed on Form 10-K (or Form 20-F or 40-F for foreign companies) with the Securities and Exchange Commission (SEC) and they clearly inform shareholders that companies may incur significant financial losses related to electromagnetic fields. Safety is not assured.

As an example, Crown Castle states in their [2020 Annual Report](#), “If radio frequency emissions from wireless handsets or equipment on our communications infrastructure are demonstrated to cause negative health effects, potential future claims could adversely affect our operations, costs or revenues. The potential connection between radio frequency emissions and certain negative health effects, including some forms of cancer, has been the subject of substantial study by the scientific community in recent years. We cannot guarantee that claims relating to radio frequency emissions will not arise in the future or that the results of such studies will not be adverse to us...If a connection between radio frequency emissions and possible negative health effects were established, our operations, costs, or revenues may be materially and adversely affected. We currently do not maintain any significant insurance with respect to these matters.”

We have attached to this letter the following resources and tools you can use to address these environmental exposure in schools:

- The Collaborative for High Performance Schools (the United States’ first green building rating program especially designed for K-12 schools) developed [Best Practices](#) for Low-EMF classrooms in 2014, addressing both wireless and ELF-EMF.<sup>43</sup>
- In 2017, the Maryland State Children’s Environmental Health And Protection Advisory Council issued first ever [state recommendations](#) for reducing wireless exposure in schools by providing wired—rather than wireless—Internet connections.
- The New Jersey Education Association article, ["Minimize Health Risks from Wireless Devices"](#)<sup>44</sup> details several recommendations for reducing the health risks posed by wireless technology, such as “Keep devices away from the body” and “hard wire all devices, including printers, projectors and boards.”Download [PDF](#).<sup>45</sup>
- [“Guidelines for Safer Use of Wireless Technology in Classrooms”](#) were developed for the New York State United Teachers, who also passed a Resolution [“Hazards of Wireless Radiation Emission.”](#)<sup>46,47</sup>
- [The United Educators of San Francisco \(teacher Union\)](#) passed a resolution recommending the [California Department of Public Health](#) issued [guidance](#) on how to reduce exposure to cell phone radiation be disseminated to all students and staff.<sup>50,51</sup>
- [Education modules](#) were developed in partnership with the Massachusetts Breast Cancer Coalition to teach high school and middle schoolers about why and how to reduce radiation from cell phones and wireless devices.<sup>52</sup>



- A [2017 study](#) found the environmental exposure to RF radiation in some schools with Wi-Fi is higher than reported levels for non-thermal biological effects and the researchers recommend schools prefer wired network connections and allow laptop, tablets, and mobile phone usage only in flight/airplane mode and this was followed by a [2019 publication](#) in the industry journal *Building and Environment* details best practices in buildings to reduce radiofrequency as including wired technology instead of Wi-Fi and corded phones.<sup>48</sup>
- Environmental Health Trust has developed a [checklist](#) of actions for schools to reduce EMF.<sup>49</sup>

We offer our expertise to support you in making these changes. Please see the attached resources with additional documentation. We are available to meet with your leadership to present how to reduce and mitigate the risks of radiation exposure. Thank you for your consideration and action on this issue.

A handwritten signature in black ink that reads "Devra Davis".

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## Scientific References

<sup>1</sup> Priyanka Bandara, David O Carpenter, [Planetary electromagnetic pollution: it is time to assess its impact](https://doi.org/10.1016/S2542-5196(18)30221-3), *The Lancet Planetary Health*, Volume 2, Issue 12, 2018, Pages e512-e514, ISSN 2542-5196, [https://doi.org/10.1016/S2542-5196\(18\)30221-3](https://doi.org/10.1016/S2542-5196(18)30221-3). "A recent evaluation of 2266 studies (including in-vitro and in-vivo studies in human, animal, and plant experimental systems and population studies) found that most studies (n=1546, 68.2%) have demonstrated significant biological or health effects associated with exposure to anthropogenic electromagnetic fields." and [The REFLEX project](https://itis.swiss/assets/Downloads/Papers-Reports/Reports/REFLEXFinal-Report171104.pdf) (risk evaluation of potential environmental hazard from low energy electromagnetic field exposure using sensitive *in vitro* methods) funded by the European Union, involving 12 independent research groups 2004 Final Reports found at <https://itis.swiss/assets/Downloads/Papers-Reports/Reports/REFLEXFinal-Report171104.pdf> and Belpomme et al., [Thermal and non-thermal health effects of low intensity non-ionizing radiation: An international perspective](https://doi.org/10.1016/j.envpol.2018.07.019), *Environmental Pollution*, Volume 242, Part A, 2018, Pages 643-658, ISSN 0269-7491, <https://doi.org/10.1016/j.envpol.2018.07.019> and Carlberg M, Hardell L., [Evaluation of Mobile Phone and Cordless Phone Use and Glioma Risk Using the Bradford Hill Viewpoints from 1965 on Association or Causation](https://doi.org/10.1155/2017/9218486), *Biomed Res Int*. 2017;2017:9218486. doi: 10.1155/2017/9218486. Epub

<sup>2</sup> Tate, Emily. "5G for Education Is Finally Here. First Stop? Cleveland." *EdSurge*, 29 Sept. 2019, [www.edsurge.com/news/2019-09-28-5g-for-education-is-finally-here-first-stop-cleveland](http://www.edsurge.com/news/2019-09-28-5g-for-education-is-finally-here-first-stop-cleveland) and Smart Young, Taiia. "A Cleveland School Is the First to Receive Verizon 5G." *3BL Media*, 3BL Media, LLC, 2 Jan. 2020, [www.3blmedia.com/News/Cleveland-School-First-Receive-Verizon-5G](http://www.3blmedia.com/News/Cleveland-School-First-Receive-Verizon-5G)

<sup>3</sup> Gerst, Matthew B., et al. *COMMENTS OF CTIA CTIA Submits These Comments in Response to the Federal Communications Commission's (Commission's) Notice of Proposed Rulemaking (NPRM) Seeking*

Comment on the 5G Fund. CTIA, 25 June 2020,  
<https://ecfsapi.fcc.gov/file/106252501924218/200625%20CTIA%205G%20Fund%20Comments.pdf>

<sup>4</sup> McNicholas, Sean. “ABC’s and 123’s: 5G and the Classroom.” *CTIA*, 27 Aug. 2019,  
[www.ctia.org/news/abcs-and-123s-5g-and-the-classroom](http://www.ctia.org/news/abcs-and-123s-5g-and-the-classroom)

<sup>5</sup> “What’s Happening Internationally.” *Environmental Health Trust*, 29 June 2020,  
[ehtrust.org/policy/international-policy-actions-on-wireless](http://ehtrust.org/policy/international-policy-actions-on-wireless)

<sup>6</sup> International Agency for Research on Cancer, et al. *Non-Ionizing Radiation. Part 2: Radiofrequency Electromagnetic Fields* Vol. 80, Amsterdam-Netherlands, Netherlands, Amsterdam University Press, 2002.

<sup>7</sup> Baan, Robert, et al. “Carcinogenicity of Radiofrequency Electromagnetic Fields.” *The Lancet Oncology*, vol. 12, no. 7, 2011, pp. 624–26. *Crossref*, doi:10.1016/s1470-2045(11)70147-4.

<sup>8</sup> Yakymenko, Igor, et al. “Oxidative Mechanisms of Biological Activity of Low-Intensity Radiofrequency Radiation.” *Electromagnetic Biology and Medicine*, vol. 35, no. 2, 2015, pp. 186–202. *Crossref*, doi:10.3109/15368378.2015.1043557.

<sup>9</sup> Bandara, Priyanka, and David O. Carpenter. “Planetary Electromagnetic Pollution: It Is Time to Assess Its Impact.” *The Lancet Planetary Health*, vol. 2, no. 12, 2018, pp. e512–14. *Crossref*, doi:10.1016/s2542-5196(18)30221-3.

<sup>10</sup> Clegg, Frank M., et al. “Building Science and Radiofrequency Radiation: What Makes Smart and Healthy Buildings.” *Building and Environment*, vol. 176, 2020, p. 106324. *Crossref*, doi:10.1016/j.buildenv.2019.106324.

<sup>11</sup> Carles, Camille, et al. “Residential proximity to power lines and risk of brain tumor in the general population.” *Environmental Research*, vol. 185, 2020, p. 109473. *Crossref*, doi:10.1016/j.envres.2020.109473.

<sup>12</sup> Carlberg, Michael, and Lennart Hardell. “Evaluation of Mobile Phone and Cordless Phone Use and Glioma Risk Using the Bradford Hill Viewpoints from 1965 on Association or Causation.” *BioMed Research International*, vol. 2017, 2017, pp. 1–17. *Crossref*, doi:10.1155/2017/9218486.

<sup>13</sup> Peleg, Michael, et al. “Radio Frequency Radiation-Related Cancer: Assessing Causation in the Occupational/Military Setting.” *Environmental Research*, vol. 163, 2018, pp. 123–33. *Crossref*, doi:10.1016/j.envres.2018.01.003.

<sup>14</sup> Miller, Anthony B., L. Lloyd Morgan, et al. “Cancer Epidemiology Update, Following the 2011 IARC Evaluation of Radiofrequency Electromagnetic Fields (Monograph 102).” *Environmental Research*, vol. 167, 2018, pp. 673–83. *Crossref*, doi:10.1016/j.envres.2018.06.043.

- <sup>15</sup> Russell, Cindy L. “5 G Wireless Telecommunications Expansion: Public Health and Environmental Implications.” *Environmental Research*, vol. 165, 2018, pp. 484–95. *Crossref*, doi:10.1016/j.envres.2018.01.016.
- <sup>16</sup> Belpomme, Dominique, et al. “Thermal and non-thermal health effects of low intensity non-ionizing radiation: An international perspective.” *Environmental Pollution*, vol. 242, 2018, pp. 643–58. *Crossref*, doi:10.1016/j.envpol.2018.07.019.
- <sup>17</sup> Roda, Claudia, and Susan Perry. “Mobile phone infrastructure regulation in Europe: Scientific challenges and human rights protection.” *Environmental Science & Policy*, vol. 37, 2014, pp. 204–14. *Crossref*, doi:10.1016/j.envsci.2013.09.009.
- <sup>18</sup> Miller, Anthony B., Margaret E. Sears, et al. “Risks to health and well-being from radio-frequency radiation emitted by cell phones and other wireless devices.” *Frontiers in Public Health*, vol. 7, 2019. *Crossref*, doi:10.3389/fpubh.2019.00223.
- <sup>19</sup> Lissak, Gadi. Adverse physiological and psychological effects of screen time on children and adolescents: Literature review and case study *Environmental Research*, vol. 164, 2018, pp. 149–57. *Crossref*, doi:10.1016/j.envres.2018.01.015.
- <sup>20</sup> Hedendahl, Lena K., et al. “Measurements of Radiofrequency Radiation with a body-borne exposimeter in Swedish schools with Wi-Fi.” *Frontiers in Public Health*, vol. 5, 2017. *Crossref*, doi:10.3389/fpubh.2017.00279.
- <sup>21</sup> Kostoff, Ronald N., et al. “Adverse health effects of 5G mobile networking technology under real-life conditions.” *Toxicology Letters*, vol. 323, 2020, pp. 35–40. *Crossref*, doi:10.1016/j.toxlet.2020.01.020.
- <sup>22</sup> Siervo, Beatrice, et al. “Numerical evaluation of human exposure to WiMax patch antenna in tablet or laptop.” *Bioelectromagnetics*, vol. 39, no. 5, 2018, pp. 414–22. *Crossref*, doi:10.1002/bem.22128.
- <sup>23</sup> Park, JinKyung, et al. “Extremely Low-Frequency Magnetic Fields Exposure Measurement during Lessons in Elementary Schools.” *International Journal of Environmental Research and Public Health*, vol. 17, no. 15, 2020, p. 5284. *Crossref*, doi:10.3390/ijerph17155284.
- <sup>24</sup> Adejoke Olukayode Obajuluwa, Ayodele Jacob Akinyemi, Olakunle Bamikole Afolabi, Khalid Adekoya, Joseph Olurotimi Sanya, Azeez Olakunle Ishola, Exposure to radio-frequency electromagnetic waves alters acetylcholinesterase gene expression, exploratory and motor coordination-linked behaviour in male rats, *Toxicology Reports*, Volume 4, 2017, Pages 530-534, ISSN 2214-7500 and Ibitayo, A., Afolabi, O., Akinyemi, A., Ojiezeh, T., Adekoya, K. and Ojewunmi, O., 2017. RAPD Profiling, DNA Fragmentation, and Histomorphometric Examination in Brains of Wistar Rats Exposed to Indoor 2.5 Ghz Wi-Fi Devices Radiation. *BioMed Research International*, 2017, pp.1-6. And Li ZQ et al., Testing of behavioral and cognitive development in rats after prenatal exposure to 1800 and 2400 MHz radiofrequency fields. *J Radiat Res.* 2020 Mar 23;61(2):197-206 and Deshmukh, P.S., et al. “Cognitive impairment and neurogenotoxic effects in rats exposed to low-intensity microwave radiation.” *International Journal of Toxicology*, vol. 34, no. 3, 2015, pp. 284-90 and Kishore, GK, Venkateshu, KV, Sridevi, NS. Effect of 1800-2100 MHz electromagnetic radiation on learning-memory and hippocampal morphology in Swiss albino mice. *J Clinical and Diagnostic Research.* 13(2); Feb 2019. DOI: 10.7860/JCDR/2019/39681.12630 and Odaci E, O. Bas and S. Kaplan. Effects of prenatal exposure to a 900 megahertz electromagnetic field on the dentate gyrus of rats:

a stereological and histopathological study. *Brain Research*, no. 1238, 2008, 224–9 and Bas O, et al. Chronic prenatal exposure to the 900 megahertz electromagnetic field induces pyramidal cell loss in the hippocampus of newborn rats. *Toxicology and Industrial Health*, vol. 25, 2009, pp. 377–84 and Aldad, Tamir S., et al. “Fetal radiofrequency radiation exposure from 800-1900 Mhz-rated cellular telephones affects neurodevelopment and behavior in mice.” *Scientific Reports*, vol. 2, no. 312, 2012 and Foerster M., Thielens A., Joseph W., Eeftens M., Rössli M. (2018) A prospective cohort study of adolescents’ memory performance and individual brain dose of microwave radiation from wireless communication. *Environmental Health Perspectives* and Sonmez, O.F., et al. “Purkinje cell number decreases in the adult female rat cerebellum following exposure to 900 MHz electromagnetic field.” *Brain Research*, no. 1356, 2010, pp. 95-101.

<sup>25</sup> McInerney, Thomas K. et al. Letter to Representative David Kusinich. *American Academy of Pediatrics Letters*, 7 April 2020 and Fernández, C., et al. “Absorption of wireless radiation in the child versus adult brain and eye from cell phone conversation or virtual reality,” *Environmental Research*, vol. 167, 2018, pp. 694–99. *Crossref*, doi:10.1016/j.envres.2018.05.013.

<sup>26</sup> Luo, Jiajun, et al. “Genetic susceptibility may modify the association between cell phone use and thyroid cancer: A population-based case-control study in Connecticut,” *Environmental Research*, vol. 182, 2020, p. 109013. *Crossref*, doi:10.1016/j.envres.2019.109013.

<sup>27</sup> Peart, Karen N. “Cell phone use in pregnancy may cause behavioral disorders in offspring,” *YaleNews*, 15 Mar. 2012,

<sup>28</sup> Avendaño, Conrado, et al. “Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation,” *Fertility and Sterility*, vol. 97, no. 1, 2012, pp. 39-45.e2. *Crossref*, doi:10.1016/j.fertnstert.2011.10.012.

<sup>29</sup> Adams, Jessica A., et al. “Effect of mobile telephones on sperm quality: A systematic review and meta-analysis,” *Environment International*, vol. 70, 2014, pp. 106–12. *Crossref*, doi:10.1016/j.envint.2014.04.015.

<sup>30</sup> Kostoff Ronald N., and Clifford G.Y. Lau. “Modified health effects of non-ionizing electromagnetic radiation combined with other agents reported in the biomedical literature,” *Microwave Effects On DNA And Proteins*, edited by Chris D. Geddes, 2017, pp. 97-157,

<sup>31</sup> Belpomme, Dominique, et al. “Thermal and non-thermal health effects of low intensity non-ionizing radiation: An international perspective,” *Environmental Pollution*, vol. 242, 2018, pp. 643–58. *Crossref*, doi:10.1016/j.envpol.2018.07.019.

<sup>32</sup> Pall, Martin L. “Wi-Fi is an important threat to human health,” *Environmental Research*, vol. 164, 2018, pp. 405–16. *Crossref*, doi:10.1016/j.envres.2018.01.035.

<sup>33</sup> Kelley, Elizabeth, et al. “International Appeal: Scientists call for protection from non-ionizing electromagnetic field exposure,” *European Journal Of Oncology* vol. 20, 2015, pp. 180-182.

<sup>34</sup> 5G Appeal to the European Union (414 Scientists as of January 2020) and Kostoff, Ronald N., et al. “Adverse health effects of 5G mobile networking technology under real-life conditions,” *Toxicology Letters*, vol. 323, 2020, pp. 35–40. *Crossref*, doi:10.1016/j.toxlet.2020.01.020 and Frank JW, Electromagnetic fields,

5G and health: what about the precautionary principle? J Epidemiol Community Health Published Online First: 19 January 2021. doi: 10.1136/jech-2019-213595 and 2020 Consensus Statement of UK and International Medical and Scientific Experts and 5G Appeal to the European Union and The Cyprus Medical Association, the Vienna Austrian Medical Chamber and the Cyprus National Committee on Environment and Children's Health released the 2017 Nicosia Declaration. See a full list at <https://ehtrust.org/science/medical-doctors-consensus-statements-recommendations-cell-phoneswireless/>

<sup>35</sup> Schools Worldwide Removing the Wi-Fi and Reducing Exposure,” *Environmental Health Trust*, 17 May 2017, [ehtrust.org/schools-worldwide-removing-wifi-reducing-exposure](https://ehtrust.org/schools-worldwide-removing-wifi-reducing-exposure).

<sup>36</sup> Oregon State Legislature, SB283 2019 Regular Session, *Oregon Legislative Information System*, accessed July 1, 2020, <https://olis.leg.state.or.us/liz/2019R1/Measures/Overview/SB283>.

<sup>37</sup> State of New Hampshire General Court. *Final Report of the Commission to Study the Environmental & Health Effects of Evolving 5G Technology*. 1 November 2020, <http://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf>

<sup>38</sup> “White paper explores risks that could become ‘the next asbestos.’” *Business Insurance*, 17 May 2011

<sup>39</sup> “Electromagnetic Fields: More than Just an Eye Sore.” Willis, March 2012.

<sup>40</sup> “Electromagnetic Fields (Utilities) Liability Insurance.” *CompleteMarkets*, [completemarkets.com/Electromagnetic-Fields-Utilities-Liability-Insurance/Storefronts](https://www.completemarkets.com/Electromagnetic-Fields-Utilities-Liability-Insurance/Storefronts). Accessed 1 July 2020.

<sup>41</sup> THE SCHOOL POLICY® Genesis Insurance Company, 2014, <https://ehtrust.org/wp-content/uploads/Portland-Public-School-2017-18-Excess-Liability0D0A-policy-1.pdf>.

<sup>42</sup> *New Emerging Risk Insights*, Swiss Re Institute, May 2019, <https://ehtrust.org/wp-content/uploads/Swiss-Re-SONAR-Publication-2019-excerpt-1.pdf>.

<sup>43</sup> *Low-EMF Best Practices*, The Collaborative for High Performance Schools, 2014, [https://ehtrust.org/wp-content/uploads/2015/12/US-CHPS\\_Criteria\\_2014\\_Low-EMF-Criteria102314.pdf](https://ehtrust.org/wp-content/uploads/2015/12/US-CHPS_Criteria_2014_Low-EMF-Criteria102314.pdf).

<sup>44</sup> Markowitz, Adrienne, and Eileen Senn. “Minimize Health Risks from Electronic Devices.” *New Jersey Education Association*, 2 Sept. 2016, [www.njea.org/minimize-health-risks-from-electronic-devices](http://www.njea.org/minimize-health-risks-from-electronic-devices).

<sup>45</sup> Markowitz, Adrienne, and Eileen Senn. “Minimize Health Risks from Electronic Devices.” 2 Sept. 2016

<sup>46</sup> “Health and Safety Webinars.” *New York State United Teachers*, 2016, [www.nysut.org/resources/special-resources-sites/workplace-health-and-safety/webinars](http://www.nysut.org/resources/special-resources-sites/workplace-health-and-safety/webinars)

<sup>47</sup> Ibid.

<sup>48</sup> Hedendahl, Lena K., et al. “Measurements of Radiofrequency Radiation with a body-borne exposimeter in Swedish schools with Wi-Fi.” *Frontiers in Public Health* 5 (2017): 279 and Clegg, Frank M., et al. “Building Science and Radiofrequency Radiation: What Makes Smart and Healthy Buildings.” *Building and Environment*, vol. 176, 2020, p. 106324. *Crossref*, doi:10.1016/j.buildenv.2019.106324

<sup>49</sup> “Checklist on How to Reduce EMF and Wireless Radiation for Schools.” Environmental Health Trust, accessed September 11, 2020,

<sup>50</sup> “CDPH Issues Guidelines on How to Reduce Exposure to Radio Frequency Energy from Cell Phones.” California Department of Public Health, December 13, 2017, <https://www.cdph.ca.gov/Programs/OPA/Pages/NR17-086.aspx>

<sup>51</sup> “How to Reduce Exposure to Radio Frequency Energy from Cell Phones.” California Department of Public Health, accessed July 1, 2020, <https://www.cdph.ca.gov/Programs/CCDPPH/DEODC/EHIB/CDPH%20Document%20Library/Cell-Phone-Guidance.pdf>

<sup>52</sup> “Let’s Talk Prevention: Actions You Can Take Classroom Modules.” Massachusetts Breast Cancer Coalition, accessed July 1, 2020.